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## Farming nation that does not produce chemical fertilizer – the reality of Arabia's bread basket

Sudan has been called the "Arabian bread basket" for millennia. It was always said to be a country with high potential for agricultural production. It is also a country which does not manufacture any chemical fertilizer.

Onion field waiting for irrigation

We have mentioned Sudan several times before in AAINews. This time I had the chance to visit the country for three weeks. Sudan is the third largest country in Africa with a land area of 1,880,000 km², or around five times as big as Japan, even after South Sudan became independent. After the independence of South Sudan, oil revenue went down sharply, making agriculture even more important. Country's arable land is said to be approximately 84 million ha, however areas that are regularly cultivated are between 10 to 14 million ha. Much of that is rain-fed and irrigation farmland accounts for around 2 million ha. Rain-fed agriculture is unstable and fluctuate in terms of cultivated area and yield, as it is impacted by the amount and patterns of rainfalls. As in other countries, the role irrigation agriculture in Sudan plays is significant. Although irrigated farmland is only 5 % of the total cultivated area in the country, grain production from this area accounts for one third of the total production.

On the other hand, low productivity even on the irrigated farmlands is a major issue in Sudan's agriculture. For example, if we compare the production of wheat and cotton with the neighboring country of Egypt, there is an obvious difference. It is clear that there is potential for Sudan to increase its productivity.

Yield comparison of irrigated wheat and cotton (kg/ha)

| Crop | Sudan | Egypt | Ratio |
|---|---|---|---|
| Wheat | 1,736 | 6,350 | 27.30% |
| Cotton | 1,211 | 2,847 | 42.50% |

Source: FAOSAT (Average of 2009-2013)

The main reasons for this low productivity is the high cost of agricultural materials such as fuel, fertilizer, seeds, and pesticide. This creates a cycle of low chemical fertilizer input leading to low yield. Although Sudan is a farming country, it does not have a single factory that produces chemical fertilizer and the country is entirely dependent on imports. In recent years fertilizer price hikes have made it even more difficult for farmers to access fertilizers.

In addition to material inputs, there is potential also to improve agricultural yield by improving irrigation. Largely, Sudan's irrigation systems are managed by the central government, state governments, private sector companies and farmers. There is no lining in the canals and the irrigation method used is mainly basin irrigation, and people are not feeling the need for water saving, or rather they are not aware of the need for water saving. Although at this stage, there are ample water resources, people are dependent on water from limited water source such as the Nile. In order to expand irrigation areas to increase food production, it will be increasingly important to utilize water resources more efficiently.


Maintenance of irrigation channel with heavy machinery

Tertiary channel and irrigated farm land

Incidentally, Sudan received investments in farmlands from countries such as Gulf States and China. Crops produced on these farms are exported to these countries under official agreements. It is a business of "lending farmland and water" for a fee. At the same time, Sudan received a large amount of food aid while still exporting wheat. I hope that Sudan will be able to become a real bread basket rather than the current slightly skewed bread basket.

Clay pots for drinking water often seen on streets

Ferry on the Nile

(By Koto, November 2014)

# Being a good "interface" <Part 6>

## Meaning of linking

**Linking and interface**
In this series, we have considered potentials of using "interface" as a key word. As we have discussed by using different case studies, we can "link" people, entities and things, through "interface".

Incidentally, while we have focused on "linking" throughout the series, what we first touched upon at the beginning of the series was "separation". Not knowing each other is a cause for this separation. Therefore, mutual understanding is critical and the role of interface is exactly to support this understanding.

**Interface involves people**
As we introduced in part 2 "Extension workers, linking farmers and researchers" and part 3 "Linking different organizations", by connecting individuals, a network of stakeholders is established, invigorating existing organizations and systems. As the case studies showed, the center of linkages is people. It has become evident that it is important to shorten psychological distance by getting to know each other, through establishing networks by linking them thereby enriching human connections.

**In order to link effectively**
In addition, in order to effectively link people through interface, it is important to know both sides. For instance, in order to prevent separation between farmers and researchers, extension staff who are in between the two sides need to be able to bridge the divide. It is expected that extension staff can link needs that farmers will face, with research and experiments which can respond to these needs. We also introduced the fact that foreigners (in our case Japanese experts) can play an important role as "glue" to link different organizations.

**Empathy for effective communication**
We discussed the theme "Interpreters - connecting people with nature" in part 4, and "Linking people and information" in part 5. We discussed the importance of communicating thoughts and feelings within a message and how interpreters need to be able to empathize with others' viewpoints, understanding what the receivers of information are looking for.

**Interface as catalyst**
Interaction and exchanges between different people and entities can yield significant benefits. In addition, there is always a possibility that something new is conceived from such interactions.

In the field of chemistry, there are "catalysts" that play an extremely important and interesting role in stimulating reactions. In some ways, development assistance is like chemical reactions caused by exchanges between people. In this sense, functions of interface as catalysts is highly important.

Also in order to ensure that the "chemical reaction" is a good quality one, it is important for the "catalyst" (interface) to be able to make appropriate judgements based on particular circumstances. Furthermore, catalysts themselves need to grow so as to continue to increase quality of chemical reactions into the future.

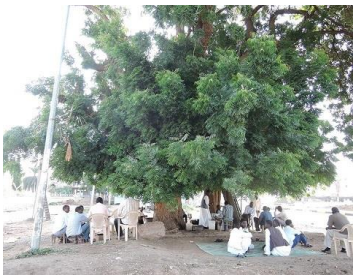
| Case Study | Role as interface | Points to note and future challenges |
|---|---|---|
| Extension staff – linking farmers and researchers | Linking needs and problems of farmers and research institutions (researchers). | • Strengthen human relationships between extension staff and researchers.<br>• Communication skills and trusting relationship with farmers.<br>• Pay attention to extension needs and changes in extension staff's roles. |
| Japanese (third party) – linking different organizations | Japanese expert acting as glue between people from different organizations and units cooperates to implement a project. | • Getting to know one another and increasing opportunities for joint action are effective ways to shorten "distance".<br>• Division of roles among related organizations and strengthening function as organizations. |
| Interpreter – linking people and nature | Linking people and nature through interpretation as part of environmental education programs etc. | • Communicate messages rather than simply transferring knowledge.<br>• It is necessary to have skills and tools to ensure more smooth communication of messages. |
| Media – linking people and information | Linking various people through database and PA media such as newsletters and brochures. | • Contents of information and methods of communication (how to process and show the information) are important.<br>• It is necessary to understand intended information recipients' understanding and have empathy towards what they are looking for. |

# A Memoir of Kassala, Sudan <Part 6>

## Life with delicious coffee

The town of Kassala in eastern Sudan is "painted" with coffee. It is close to the origin of coffee, Ethiopia, and people enjoy drinking coffee even more in Kassala than they do in Khartoum. All over the town one can see people pouring coffee while burning incense. Simple cafes are everywhere in town and laughter echoes from here and there.

Fired clay pot – Jabana



Having a cup at a tree café

The original traditional coffee making equipment is a bottle gourd-shaped clay container called Jabana. People use their favorite Jabana set to offer coffee to their guests. It starts slowly with firing charcoals using a hand-held fan. The strong coffee, derived from the deeply roasted coffee beans comes with plenty of ginger. Depending on peoples' tastes, spices such as black pepper, cloves, cardamom, and cinnamon are added. A lot of sugar is added as if trying to neutralize the spiciness. At first, one gets bewildered by the spicy ingredients such as the ginger. However once one becomes used to drinking the brew, without these extra ingredients, one feels something is missing.

Coffee making ceremony to offer hospitality

Blending spices according to taste

Coffee trees are not grown in Kassala. Fresh coffee beans are imported from Ethiopia and South Sudan. When dropping by at one of the cafés under a tree before going to work, colleagues start gathering and early morning information exchanges start. After taking breakfast at the canteen, there is also another relaxing cup. After field work in the heat of the day, when dropping by in a village for a rest, villagers' coffee is served and tiny coffee cups are passed around.

Making coffee in the open field

Deep roasted coffee

Jabanas at a tourist spot

Burning frankincense

Colorful cafes line up at the foot of rocky mountains where tourists visit. When water flows in Gash River, seasonal café terraces emerge offering people cooling sanctuaries. During the evening hours when day time temperatures are softening, I would invite myself to some coffee brewed by the Hadendoa guard. As usual, he would use fibers from Doum palm fronds as a filter, stuffing them in the spout of his Jabana, conducting silent rather ceremonial maneuvers with his wrinkly hands. Calm moments pass by while he pours 2nd and 3rd helpings of coffee. These are gentle times in a day full of busy working hours.

Samurai coffee

By a Gash (ephemeral river)

I like drinking coffee in an air-conditioned café in Japan with internet facilities with a book in one hand. However, I feel blissfully happy when I spend time slowly chatting besides a Jabana. If I have an opportunity to visit Kassala again I will, above all, definitely go on a serious "cafe crawl."

Mini series

# Reports on activities of ex-participants from Nepal <Part 2>

## Application of cultivation technology acquired in training in Japan in the participants' own country

This series, we reported on my visit to Nepalese ex-participants in December 2014 as part of the "Vegetable cultivation technology and marketing method for small scale farmers" course. This second part of the series, we collate case studies of returnees applying what they learned during training in Japan in their own countries.

**Application of vegetable cultivation technology acquired in training in Japan in the participants' own county**

A technique which many ex-participants recognized as useful was rain shelter tomato cultivation. In this visit, we could actually see ex-participants teaching farmers how to do this. We felt happy to know that they were accurately transferring what they learned in their training courses. For example, they were teaching how to evaluate tomato growth using the rates of tomato's stem diameter and the distance between a flower cluster and the growth point.

An ex-participant (left) evaluating tomato growth

Presently in Nepal, rain shelter tomato cultivation is widely practiced. This type of tomato cultivation has become an easily applicable technology. On the other hand, the ex-participants who were in Japan one generation earlier, had a slightly different view. When they took the courses in Japan the mainstream tomato cultivation was open field and non-training cultivation with determinate type tomato. This means rain shelter tomato cultivation was not something which can be applied immediately. However since around 2004, when rain shelter and training cultivation began, they became very much needed as extension staff who knew the special cultivation methods.

The same goes for the hybrid tomato production technology. It used not to be a technique employed in Nepal. However, as hybrid varieties were developed in recent years, people who can provide training to farmers on seed production of hybrid varieties are sought after. From these case studies, we identify two kinds of techniques that are useful in ex-participants' home countries. One is those techniques that can be immediately applied. The other is techniques that can be useful in the future. The training courses consider these two types in the curricula and this visit proved the approach to be appropriate.

In future, as expensive hybrid seeds become common, ex-participants suggested useful training topics which will have future utility. These include effective raising seedling techniques and grafting as a counter measure for nematode damage which affects repeated rain shelter tomato cultivation.

**Example of application to non-vegetable crops**

We also witnessed ex-participants applying what they learned in the training in Japan for other crops. This ex-participant who participated in the 2012 course is working on cardamom cultivation. Cardamom has slow initial growth and is susceptible to weeds. It is also susceptible to dryness and is vulnerable to high temperatures in soil. The participant thought of applying black mulch cultivation techniques which he learned in Japan.

Cultivation techniques that are based on plant physiology can be applicable to all crop production in addition to vegetable cultivation. He understood this well and was working on developing new raising seedling techniques.

**Other extension activities**

For ex-participants who are on management duties away from the cultivation field, there are limited opportunities to apply vegetable cultivation techniques which they learned in Japan. However, we discovered that they are utilizing the training results in different ways such as introducing cultivation case studies from Japan at seminars for farmers and writing about cultivation experiments during the training in Japan in a local bulletin.

During the group discussion with ex-participants, we asked for their opinions on "different cultivation environments" which often is discussed as a challenge of our training courses. Most of them said "It is important to apply knowledge and techniques adapting them to different environments. Implementing this is the job of officers – us."

In order to promote utilization of knowledge and techniques that ex-participants gained in their own countries, it is important to teach basic knowledge, as well as how one could apply the knowledge, considering that what they learn has to be applied in different environments in most cases. The fact that the above opinions were heard from ex-participants, assured me that our training policy is well communicated.

Case studies of ex-participants utilizing cultivation knowledge and techniques learned in training courses in Japan

| Example of application in vegetable cultivation technique field | Example of application in other non-vegetable crop cultivation technique field. |
|---|---|
| • Training on rain shelter tomato cultivation (6)<br>Pruning and training, growth evaluation, and pest and disease diagnosis<br>• Training on vegetable seed production techniques<br>Hybrid tomato seed production technique (5); onion seed production technique (3) cucumber seed production technique<br>• Potato cultivation technique (3)<br>Seed potato disinfection technique; increasing of disease free seed potato; planting density; fertilizer experimentation<br>• Introduction of grafting (3)<br>• Raising cell seedling experimentation (2) etc. | • Conducting mulch experiments for beet<br>• Application of black mulch for cardamom seedling production<br>• Growth evaluation and pest and disease diagnosis for cardamom seedling production<br>Other extension activities<br>• Adding vegetable cultivation topic to spice and/or fruit cultivation training for farmers (3)<br>• Writing on experiments done as part of the training in Japan in their local bulletin |

Note: Survey target was 10 ex-participants. The numbers in parentheses indicate the number of cases.